Review Article

CONCEPT AND MANAGEMENT OF DENGUE FEVER (HUMMA DANAJ) IN UNANI AND MODERN PERSPECTIVE

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Abstract

Dengue fever (Humma Danaj) is a global health problem which is the most rapidly spreading mosquito borne viral disease. In the last 50 years, incidence is increasing with geographical expansion to new countries and in the present decade, from urban to rural areas. It is an estimated that 50 million dengue infections occur annually and approximately 2.5 billion people live in dengue endemic countries. There is no specific treatment for dengue fever (Humma Danaj) in any system of medicine, besides, the dengue vaccine has a long way to go, but we can treat the symptoms of dengue fever and apply the measures to enhance the platelets count. For this purpose several measures are used to treat the symptoms of dengue fever and enhance the platelets count, in both modern and Unani system of medicine. Thus, in this article it has been discussed all the measures in Unani and modern perspective.

Keywords: Dengue fever; Humma Danaj; Platelets count; Unani medicine.

INTRODUCTION

The incidence of dengue increased 30 fold between 1960 and 2010, due to a combination of urbanization, population growth, increased international travel, and global warming.[1-2] Dengue is endemic in more than 110 countries.[3] It infects 50 to 390 million people worldwide a year, leading to half a million hospitalizations, and 25,000 deaths. For the decade of the 2000s, 12 countries in Southeast Asia were estimated to have about 3,000,000 infections and 6,000 deaths annually.[4] Dengue fever is widely prevalent in India and all the 4 serotypes are found and dengue incidence is increasing day by day. However during 2001 out breaks have been reported from Rajasthan (1433 cases and 33 deaths), Tamil Nadu, India (761 cases and 8 deaths), Karnataka, India (161 cases) Gujarat, India (46 cases).[5] The origins of the word dengue are not clear, but one theory is that it is derived from the Swahili phrase "Ka-dinga pepo", meaning "cramp-like seizure caused by an evil spirit". The Swahili word "dinga" may possibly have its origin in the Spanish word "dengue" meaning fastidious or careful, which would describe the gait of a person suffering the bone pain of dengue fever. Alternatively, the use of the Spanish word may derive from the similar-sounding Swahili. Slaves in the West Indies who contracted dengue were said to have the posture and gait of a dandy, and the disease was known as "Dandy Fever".[6-7] The word dengue is derived from African word denga: meaning fever with hemorrhage.[8-9] Dengue is a mosquito-borne disease caused by any one of four closely related dengue viruses (DENV-1, -2, -3, and -4). Infection with one serotype of DENV provides immunity to that serotype for life, but provides no long-term immunity to other serotypes. Thus, a person can be infected as many as four times, once with each serotype.[10] Dengue viruses are transmitted from person to person by Aedes mosquitoes (most often *Aedes aegypti*) in the domestic environment.[11] Humma Danaj is derived from Arabic word "Danaj" meaning weakness. Humma Danaj is named because of severe weakness occur in this fever.[12] Because of unavailability of effective vaccine and proper or specific treatment of dengue fever in modern system of medicine, there is a need of time to search for a safe, effective, acceptable treatment in any system of medicine, either in Unani or other traditional medicine.

Alternative Names

Onyong Nyang Fever, West Nile Fever, Break Bone Fever, Dengue like Disease, Dandy Fever,[13] Abul Rakab, Humma Saliba.[12]

Historical Background

Earliest description of dengue like illness was found in Chinese medical encyclopedia in 992 AD. Outbreak in the West Indies in 1635 AD and Panama in 1699 AD. The first epidemic of clinical dengue like illness was recorded in Madras, India. Documented that mosquitoes could transmit dengue fever in 1903 AD. When Dengue viruses were isolated in the laboratory mice in 1943 and 1944, the modern era of dengue research began. Albert Sabin isolated the dengue virus in 1944. In the beginning only two different dengue viruses named dengue virus type I and II. In 1956 Philippine hemorrhage fever was associated with dengue when types 3 were discovered.[5,14] It now has become endemic throughout tropical Asia (India) since 1967, after that the term dengue hemorrhagic fever and dengue shock syndrome have come into general use.

Unani Concept of Dengue Fever

In Unani literature there is as such no description of Dengue fever disease is available, but all types of fever are discussed in detail. Probably this disease is "Humma Damwi Ufooni", where ufoonat is found in blood (khilt-e-dam) and produce rashes on skin (surkh daane).[15] Sheikh Ibne Sina says there are an abnormal changes in fluids and humours because of infectious material (madah afna'h), which disrupt the personal qualities and normal activities of the fluids and humours. Humours (Akhlat) are infected sometimes intravascular (dakhil-e-urooq) and extravascular (kharij-e-urooq). But in this case intravascular (dakhil-e-urooq) infection is found because of the vector *Aedes aegypti*, who bite and transmit the disease as blood borne disease.

Etiology

Dengue is a mosquito-borne disease caused by any one of four closely related dengue viruses (DENV-1, 2, 3, and 4).[8,16-18]

Dengue Virus

Dengue viruses are spherical particles approximately 50 nm in diameter. It contains a single plus strand of RNA surrounded by a lipid bi layer. Mature viruses are composed of 6 % RNA, 9 % carbohydrate, and 17 % lipid. Because of the lipid envelope, flaviviruses are readily inactivated by organic solvents and detergents. The E protein is the major surface protein of the viral particle probably interacts with viral receptors, and mediates virus-cell membrane fusion. Antibodies that neutralize virus infectivity usually recognize this protein and mutations in E protein can affect virulence. M protein is a small proteolytic fragment which is important for maturation of the virus into an infectious form. C protein is a component nucleocapsid.[1,19]

Vector

Dengue viruses are transmitted by mosquitoes of the stegomyia family. *Aedes aegypti* a day time biting mosquito is the principal vector and all 4 types of viruses have been recovered from it. Aedes mosquitoes (Tiger mosquito): distinguished by white stripes on black body. They do not fly over long distance more than 100 meters (110 yards), this factor facilitates its eradication. They lay egg singly, and eggs are cigar shaped. Female mosquito acts as vector.[1,11,20,21]

Pathology

In rare instances death may be due to gastro intestinal or intra cranial hemorrhages. Hemorrhages are seen in: Upper GI tract, intra ventricular septum of heart, pericardium, and subserosal surfaces of major viscera; Focal hemorrhages occasionally seen in the lungs, liver, adrenals, sub arachnoids space. The liver is usually is enlarged often with fatty changes. Yellow watery at times blood tinged effusions are present in serous cavities. Microscopically, proliferation of lymphoid and plasma cystoids cells, lymphocytolysis and lymphophagocytosis occur in the spleen and lymph nodes.[8,17]

Classification and Clinical Features

Dengue fever is classified into three classes:
1. Classic Dengue fever
2. Dengue hemorrhagic fever (DHF)
3. Dengue Shock Syndrome (DSS)

Classic Dengue Fever

Onset is acute and lasts usually about 5-7 days (but can anywhere from 3-14). There are many symptoms like fever (continuous or saddle-back), extreme malaise, muscular pain, backache, pain in limbs and eyes, rashes, nausea and vomiting, headache.[16-18]

Dengue Hemorrhagic Fever

Dengue haemorrhagic fever is characterized by high continuous fever of 2 to 7 days, hepatomegaly, bleeding from gums, nose, vagina, rectum, intracranial, food passages and into skin, rapid fall in platelets count, positive tourniquet test is observed. There is plasma leakage due to an increase in vascular permeability.[16-18]

Dengue Shock Syndrome (DSS)

It is characterized by hypovolumic shock, rapid drop in temperature, clammy skin and cold extremities, low blood pressure and weak rapid pulse, ultimately goes into shock and usually dies within 12-24 hours.[17-18]

Investigations

Routine blood test (CBC, ESR, Platelets Count), clotting time, dengue serology test to identify the dengue or its foot marks in our blood, urine to check protein leak and haematuria and special test (ELISA)[11,13,20,21].

Differential Diagnosis

Differential diagnosis of dengue fever includes viral respiratory and influenza like diseases, early stages of malaria, mild yellow fever, scrub typhus, viral hepatitis and leptospirosis. Four arboviral diseases have dengue like courses but without rash colorado tick fever, sand fly fever, rift valley fever and Ross river.[16-18] Dengue haemorrhagic fever is differentiated from meningococcemia, yellow fever, other viral hemorrhagic fevers, many in rickettsial diseases and other severe illnesses caused by a variety of agents may produce clinical picture similar to dengue haemorrhagic fever.[16-18]

Diagnosis

Clinical diagnosis of dengue fever is highly suspicious but knowledge of the geographical distribution and environmental cycles of causal viruses can help in the diagnosis of dengue fever. WHO Criteria is applied for dengue haemorrhagic fever): Fever (minor or major), haemorrhagic manifestations, thrombocytopenia (< 100000 / mm^3), increased hematocrit > 20 %), hypoalbuminemia, and also X-ray can shows pleural effusion. The criteria for dengue shock syndrome are above mentioned criteria plus hypotension and narrow pulse pressure (< 20 mm of Hg), virologic diagnosis can be established by serologic tests or by isolation of the virus from blood leukocytes or serum. Both in primary and secondary dengue infections, there is relatively transient appearance of anti dengue immunoglobulin IgM antibodies. These antibodies disappear after 6-12 weeks which can be used to time a dengue infection[16-19].

Management in Unani System of Medicine

Usool-e-Ilaj (Principles of Treatment)
Izala sabab (Treat the cause)
Aram karaein (Bed Rest)
Dafe Humma (Antipyretics)
Barid Mashroobaat (Use of fluids and juices)

Habis-e-dam advia (If haemorrhage)
Mulayyanat (If constipation)
Muqawwiyat Aam advia
Muwallid dam advia

Dafe Humma (Antipyretics):
Qurs Humma 2 tab BD / Qurs Tabasheer kafoori 2tab BD or Joshanda Malaria ½ adad BD.[22]

Barid Mashroobaat wa sayyal Aghzia:
Mau shaeer, Sharbat Neelofer, Sharbat Banafsha, Sharbat Aaloo, each 2 tola Aabe kahoo, Aabe Anaar, Aabe Seb, Aabe Bahi, Arq-e-Mako, Arq-e-Kasni each 4 tola.[15,23]

Habis-e-dam advia:[22]
Qurs Habis 2tab BD+ Sharbat Injabar 2 tola BD

Moaddelat-e- Dam:
Sharbat Unnab 2 tola BD or Majoon Ushba 6gm after meal.[15]

Muqawwiyat:
Khameera Gaojaban Anbari, Khameera Marwareed, Khameera Sandal each 6 gm BD

Muwallid dam advia:
Qurs Damvi 2 tab , Qurs Sadaf 2 tab, Sharbat Faulad 2 tola or Sharbat Anarain 2 tola after meal, or Kushta Khabsul Hadeed 4 chawal.[15]

Modern Treatment
There is no specific treatment, only supportive treatment (treatment of symptoms), controlling fever, therapy for pain (to avoid aspirin and other non steroidal anti-inflammatory medications because they may increase the risk for hemorrhage and also steroids should not be used). Reminding the patients to drink more fluids, especially when they have a high fever[1,17-21].

Treatment of Dengue Haemorrhagic Fever (DHF)
Fluid replacement therapy through IV [ml / h = (drop / min) x 3] is applied in dengue haemorrhagic fever. The fluid replacement should be the minimum volume i.e. sufficient to maintain effective circulation during the period of leakage. Excessive replacement will cause respiratory distress (from massive pleural effusion and ascites), pulmonary congestion and edema. Medication to reduce fever and Blood transfusion are needed in this case.

Fluid Management
Vector control
Do not allow empty vessels, coconut shells, plastic containers, flower pots, tires etc to collect rain water in them. Cover your over tanks to prevent mosquitoes breeding in fresh water and screen your homes with mosquito screens like Netlon. Advise the patients to wear full clothing and long sleeves. Apply mosquito repellents like odomos. True community participation is also helpful in the control of disease[11].

Vaccines
Tetravalent live attenuated vaccine
Attenuated viruses of all four serotypes were developed at Mahidol University, Thailand, successfully completed phase

2 clinical trials, phase 3 trials are underway. It contains an antigen from each serotype.

Intertypic chimaeric vaccine
Structural genes from the DNA copy of an attenuated strain of dengue virus of a given serotype are replaced by the corresponding genes of a different dengue virus serotype.

Chimaeric vaccine
Replaces the E gene of the 17 D yellow fever vaccine with the analogous gene of the vaccine targeted flavivirus

Pediatric Dengue Vaccine Initiative
Established in 2003 at the International Vaccine Institute in Seoul, South Korea, researches are going underway.

Herbal Remedy for Dengue Fever
Some of the herbal drugs used to increase the platelets count are:

Papaya (*Carica papaya*) Leaf Juice
It's a fact that, to date, there is no known medical cure for dengue fever since it is caused by a virus transmitted through the bite of the Aedes mosquito. However, it seems drinking papaya leaf extract helps to bring up the platelet count.[24-25] Two pieces fresh papaya leaves (use only the leafy part, remove the stalks), wash clean, pound and squeeze out the juice. Take 2 tablespoons of bitter juice. Do not boil or dilute with water. One serving per day is recommended.

Tawa Tawa Tea (*Euphorbia hirta*)
Take 5-6 full whole Tawa Tawa plants, cut the roots, wash and clean, then fill a boiling pot with clean water. Boil the tawa tawa for 1 minute, let it cool. Drink 1 to 1.5 glass of tawa tawa water every hour for 24 hours. The internal haemorrhaging will stop and the dengue fever will be cured within 24 hours.[26]

CONCLUSION
Dengue being a new disease and not having any specific treatment is challenge for medical science and health department. Vaccines are not such effective in this disease. However modern scientific researchers are going on. Every measure is applied to control the symptoms, restrict the complications and enhance the platelets count. For this purpose there are many Unani drugs like papeeta (Carica papaya) juice,[24-25] tawa tawa (Euphorbia hirta) tea,[26] which can be used. Yet there is a need of further animal as well as clinical studies to control this disease.

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